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MANUAL

OF

CHILDBED NURSING

WITH NOTES ON

INFANT FEEDING

BY

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FIFTH EDITION

REVISED AND ENLARGED

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PREFACE TO THE FIFTH EDITION.

THIS manual was originally prepared for the Training School for Nurses at the Long Island College Hospital. It was subsequently rewritten and adapted to general use. In this edition the entire contents have been revised and much new matter has been added. While the new topics do not all fall strictly within the limitation of the title, it is believed they may prove acceptable additions.

The object has not been to furnish a text-book, but rather to aid the nurse in remembering the more important practical teachings of the hospital training. The plan of statement in condensed paragraphs has been adopted with a view to that end.

The author ventures the hope that the book, in its present form, may be found of service not only to professional nurses but to mothers as well, and to all interested in obstetrics.

C. J.

330 Clinton Avenue,
Brooklyn, N. Y.

January, 1902.

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MANUAL
OF
CHILDBED NURSING.

PREGNANCY.

MEDICAL SUPERVISION—The pregnant woman should place herself under the direction of her physician from the first months of pregnancy; should consult him frequently during the later months, and especially on the least feeling of illness.

GENERAL RULES OF HEALTH—Most essential are:

Daily open-air exercise for one or two hours;

Avoidance of exhaustion and of violent muscular exertion;

Proper action of the bowels once daily;

Eight hours of sleep daily;

Pure air at all times;

A tepid or cool bath once daily; the bath should be taken in the morning in a warm room, and with plenty of friction to secure complete reaction;

Daily cleansing of the external genitalia, especially in the later weeks of pregnancy; in

case of irritating vaginal secretions, a vaginal douche once daily, of two quarts of boiled water at the temperature of the body, and containing four tablespoonfuls of boric acid;

Clothing to suit climatic changes;

Avoidance of tight clothing, particularly about the breasts and abdomen; corsets should not be worn;

Freedom as far as possible from mental excitement and from depressing emotions.

The teeth require special care during pregnancy. They should be brushed on rising and retiring and after each meal, and the spaces between them kept free from particles of food. Examinations by the dentist at intervals of two or three months are advisable.

Diet—Milk, eggs, farinaceous foods, fruit, especially cooked fruits, with little or no sugar, meat once daily, should be the basis of the dietary.

Fried dishes, pastry, rich foods, excess of meats, of sweets, and of tea and coffee, and overeating should be avoided.

Alcoholic stimulants are forbidden, except as ordered by the medical attendant.

Six or eight goblets of pure water should be drunk daily, best within one or two hours before meals and at bedtime. It may be hot or half cold. Ice-cold drinks are injurious.

The patient should seek the advice of her physician with reference to further details.

CARE OF THE NIPPLES—During the last one or two months the nipples should be cleansed daily with a borax solution—tablespoonful to a pint of water. They may be anointed with fresh cacao butter after cleansing, and if small or sunken should be gently drawn with the thumb and fingers. Kneading them daily with clean fingers helps to prepare them for nursing. The hands should first be cleansed with soap and warm water.

EXAMINATION OF THE URINE—Once monthly during the first three months, twice monthly during the next three, and at least once weekly during the last three months, a sample of the morning urine should be sent to the doctor for examination.

Note amount of daily excretion. If it falls below sixty ounces, the quantity should be increased by drinking more water. This failing the physician should be consulted.

LABOR.

To Predict the Date of Labor—Add seven days to the date when the last menstruation began, and count forward nine months. The date thus found is usually accurate within a week.

Preparation for Labor—For the lying-in-chamber, select, if possible, a large, well-ventilated room with a southern exposure, remote from the water-closet, and having no defective waste-pipes nor other exposure to house drainage.

Cleanliness of the room and its contents, entire freedom from decomposing animal or vegetable matter and from the poisons of contagious diseases are imperative.

Especially dangerous, from the standpoint of septic infection, are childbed fever, erysipelas, suppurating wounds, cancer, and generally, diphtheria, typhoid and scarlet fever.

Much drapery is insanitary; it catches dust and disease germs.

The Nurse Should Have Ready:

A dozen clean sheets;

Six draw sheets two and a half yards in length;

A dozen towels recently laundered;

Two dozen pieces of fresh-boiled cheese-cloth, or butter-cloth, about eighteen inches square, for wash-cloths;

Four pieces of straight unbleached muslin for binders, a yard and a quarter long by half a yard wide;

A labor pad and four dozen lochial guards. (See pp. 14 and 19);

Two surgically clean rubber sheets, large enough to reach across the bed; white enamel cloth may be substituted for rubber when economy requires;

A rug, rubber sheet or oilcloth, to protect the carpet beside the bed;

Two operating gowns;

Scissors;

Two dozen safety-pins of medium size; one dozen small;

A Davidson or a fountain syringe;

Two rubber hot water bags;

A clean vessel to receive the placenta;

A bedpan of earthenware or agate ironware;

One douche-pan of similar material;

Plenty of hot and of cold water;

Six ounces of tincture of green soap;

One pint of alcohol, 95 per cent.;

A half-pint of brandy or whiskey;

Two or three clean hand-basins of agate ironware or earthenware;

A slop jar;

Two new hand-brushes;

A gas stove or alcohol lamp;

A large Arnold steam sterilizer;

One hundred bichlorid of mercury tablets;

Two ounces of glycerin as a lubricant for the doctor's hands; sterilize by heating to 212° F. or more for ten minutes;

Vaselin, or sweet-oil, sterilized by heat, for anointing the child;

A yard of aseptic strong linen bobbin, one-sixteenth-inch wide, for tying the navel-cord;

A woolen blanket for wrapping the child;

A child's bath-tub and a bath thermometer;

Castile soap of best quality;

One-half pound package of absorbent cotton;

The child's clothing.

PREPARATION OF THE BED—Cover the mattress with a muslin sheet, and that with a rubber sheet.

Spread a clean muslin sheet over the rubber and pin fast to the mattress.

Spread over that a second rubber covered with a muslin sheet.

Place two or three sheets, twice folded, in position to receive and absorb the discharges.

A thick pad of prepared jute or cotton batting, covered with cheese-cloth, may be used as a *labor pad* instead of the folded sheets. It should be about three feet square and three inches thick.

A separate cot dressed as above described may be used for the confinement instead of the bed, the patient being transferred to the bed after delivery.

STERILIZING—Labor pads and vulvar dressings, operating gowns, wash cloths, towels, binders and the ligature for the cord may be put up in small packages, each wrapped in a towel or sheet securely pinned, and sterilized by steaming for an hour. The packages are opened only as the contents are wanted for use.

Sheets, draw sheets and binders should be fresh laundered. If convenient, they may be sterilized by steam.

Rubber sheets and rubber syringe may be boiled for ten minutes in plain water.

Scissors, safety-pins and hand-brushes are boiled for ten minutes in a one per cent. solution of washing or baking soda. They are first wrapped in cheese-cloths or towels, in which they are kept till wanted for use.

Wash basins and other utensils that would not be injured thereby, may be sterilized by cleansing with soap and hot water and baking

for an hour in an oven or they may be cleansed and then immersed for several hours in a tub of bichlorid of mercury solution, 1:2000 (p. 33).

When sterilizing is impracticable, the nearest possible approach to aseptic cleanliness is imperative.

Care must constantly be used to prevent reinfection of articles that have been sterilized.

HYGIENE OF THE LYING-IN ROOM—The most scrupulous cleanliness is essential.

Pure air is at all times indispensable.

Ventilation to be effective must be constant.

An open fire, when practicable, is a good ventilator.

Sunlight is an important sanitary agent.

The temperature of the room may be from 68° to 70° F.

SIGNS OF BEGINNING LABOR—1. *Pains* in the lower abdomen and back, recurring at regular intervals, at first about once a half-hour. With the hand placed flat upon the abdomen, the uterus is felt to harden during the pains. As the labor advances the pains strengthen, and the intervals shorten to one or two minutes, or even to the fraction of a minute, toward the close of the labor.

2. The "*show*," a bloody discharge from the vagina.

3. *Evacuations* of the bladder and bowels more frequently than usual.

STAGES OF LABOR—First Stage or Stage of Dilatation—ending with the full dilatation of the neck of the womb.

Second Stage or Stage of Expulsion—ending with the birth of the child.

Third Stage or Placental Stage—ending with the expulsion of the placenta and the persistent contraction of the uterus.

DUTIES OF THE NURSE DURING THE LABOR.

FIRST STAGE—The patient should have an entire change of linen, and, if possible, a full bath with careful cleansing of the external genitals, at the beginning of labor.

Cleanse the external genitals, abdomen and thighs for ten minutes with a soft brush, green soap and warm water; then flush well for five minutes with a one in two thousand bichlorid of mercury solution. The nurse's hands should first be prepared in the manner detailed on pages 35 and 36.

An aseptic vulvar compress wet with a saturated boric acid solution may be worn during the first and second stages of labor.

Make no vaginal examinations unless ordered.

Notify the doctor when the labor begins or be guided by instructions previously obtained.

Messages to the doctor are best put in writing, and should give stage of progress and full particulars.

The patient may be dressed in her night

clothing and a loose wrapper, and may have the liberty of the room.

Tell her not to "bear down" during the pains of this stage.

The bladder should be evacuated frequently.

Make it a rule to empty the lower bowel by an enema of warm water once or more during the first stage.

A hot rectal injection stimulates the pains and therefore may or may not be proper in a given case.

Moving about the room or even the bed has a like effect.

Give such simple food and drink as the patient may require.

The nurse may do much to encourage and to reassure the patient; she should beware of alarming her with tales of her experiences in other cases.

FOR THE DOCTOR'S EXAMINATION—Have ready for the doctor's use soap, hot water, two agate ironware or earthenware hand-basins, two hand-brushes and a mercurial or formalin solution (p. 33) for cleansing the hands.

Place the patient on her back in bed, at the right side, with the clothing adjusted for the abdominal and the pelvic examinations.

Before the doctor's internal examination the nurse should prepare her hands as directed on

p. 35, and carefully re-cleanse the external genitals of the patient and their surrounding surfaces with soap and water, rinse off the soapy water and bathe the parts with the bichloride of mercury solution (p. 33).

SECOND STAGE—The patient should keep the bed from the time the labor approaches the second stage, generally after the escape of the waters or after the pains become severe; she should not, as a rule, be permitted to leave the bed during the second stage, not even for evacuations of the bladder or the bowels.

She should be dressed for the bed with her clothing tucked under the arms and pinned and with a surgically clean folded sheet fastened about the waist in the manner of a skirt.

Her personal and bed clothing should, as nearly as possible, be clean in the surgical sense.

In hospital practice the lower extremities may be covered with a pair of long loose muslin stockings, made aseptic by steaming.

Firm pressure against the lower part of the back during the pains usually gives relief.

The patient may be allowed to pull upon the hand of a bystander during the pains, or upon a sheet tied to the foot of the bed. This, however, increases the expelling power and should be omitted in over-rapid labor.

Giving Chloroform—Have the head low and clothing loose. Remove false teeth. Smear the skin about the mouth and nose with vaselin or glycerin, to prevent "burning" by the chloroform.

Spread a thin towel over the patient's face; lift it by the middle six or seven inches so as to form a large air-chamber about the face.

Drop the chloroform upon the upper surface of the towel, opposite the mouth and nose, one drop with each breath. Ask the patient to breathe rapidly at the beginning of the pain. Five to ten drops are usually enough for an ordinary pain. The object is to blunt, not to abolish sensation.

Give the anesthetic during the pain only, the inhalation beginning promptly with the pain. Usually it may be pushed to unconsciousness during the passage of the head over the perineum, by continuous inhalation.

For Version or Forceps Operation—Place the patient upon her back directly across the bed, or, better, on a table, with the hips close to the edge and the knees drawn far up and well apart.

Each lower extremity may be covered with a separate sheet or blanket or with the stockings previously mentioned specially made for the purpose.

One assistant is usually required at each of the knees to hold them in the position described, or a Robb or Kelly leg-holder may be used instead.

THIRD STAGE—The nurse may be required to "hold the fundus," while the doctor is otherwise engaged. This consists in "watching" the uterus by laying the hand lightly upon the abdominal wall, over the uterus, to know whether it remains properly contracted. Moving the abdominal wall in a circular direction over the surface of the uterus, or firmly grasping the womb may be needed to promote contractions.

Keep the placenta for the doctor's examination; afterward destroy by burning in the range or furnace fire.

At the close of the third stage the patient's body should be cleansed of blood and discharges by bathing with an antiseptic—preferably the mercurial solution (p. 33).

Sea sponges should not be used for bathing the genitals, but fresh-boiled cheese cloths instead, which have lain for several minutes in the antiseptic solution immediately before use.

The nurse should brush and disinfect her hands again before cleansing the genitals.

The upper rubber sheet should be removed

and all soiled bedding and soiled clothing replaced with clean.

Usually the remaining rubber sheet is not needed after four or five days.

A draw-sheet, consisting of an aseptic muslin sheet twice folded, may be placed under the patient's hips. It should be changed as often as it becomes soiled.

Vulvar Dressing—Cover the external genitals, after cleansing, with a folded napkin, the lochial guard, which has previously been steamed, or boiled and dried. Hold in place with a T bandage.

A good substitute for the napkin as a vulvar dressing is a *lochial guard* made of aseptic cotton batting, loosely packed and enveloped in cheese-cloth. The guards should be three inches thick, four inches wide, ten inches long, and provided with a ten-inch tail piece at each end for fastening to the abdominal binder. Sterilize before and burn after using.

The Binder should reach from the breast bone to a point just below the hips. Pin with safety-pins and moderately tight for the first twelve hours, thereafter less firmly.

The binder serves no purpose except to promote the comfort of the patient by supporting the lax abdominal walls and perhaps to favor the contraction of the uterus. Too much con-

striction by impairing the tonicity of the muscles may tend to prevent rather than to favor the return of the waist to its proper shape. Discard after one or two weeks.

THE PUERPERAL PERIOD.

POINTS TO BE NOTED BY THE NURSE.

General Condition of the patient, appetite, color and expression of the face, appearance of the tongue, pains, chills.

Pulse—The normal pulse-rate of the puerperal woman is lower than her ordinary pulse.

Temperature—The physiological upper limit for the first four days is 99½°, thereafter 99° F.

Evacuations of the bladder and bowels.

Breasts, distended, hard, painful, nipples malformed, small, sunken, tender, or cracked.

Abdomen, bloated, tender on pressure.

Uterus—The uterine contractions should be firm, at first intermittent, after about an hour nearly persistent. Tenderness on pressure over the uterus should diminish daily and should disappear after three or four days.

Fundus at the close of labor nearly midway between the navel and the pubes, a few hours later at the navel, tenth day at the pubes. Note

that the uterus may be pushed up bodily by a full bladder or rectum.

Lochia—The normal flow is more or less bloody for about four days, paler and thinner for three or four, then creamy; it gradually diminishes in quantity from the close of labor. Total amount in the first two weeks about 3¼ lbs. Duration two to four weeks. It should never have a fetid odor.

Watch closely the amount of flow, especially during the first two or three hours after labor.

Urine—Note the quantity of urine and the frequency of urination.

Danger Signals—A pulse of 100 or more during the first few hours after delivery may be a forewarning of hemorrhage.

A soft, flabby condition of the uterus after labor is likely to be attended with dangerous bleeding.

A bloody flow lasting more than four or five days after labor, or recurring subsequently, or persistent sacral pain, should be reported to the physician; occurring in the third week or later these symptoms may indicate displacement of the uterus.

Continuous pain in the suprapubic region or dribbling of urine may mean over-distention of the bladder.

Persistent pain is abnormal.

After-pains too severe or lasting too long should be reported to the physician.

A chill with high temperature is evidence of serious illness. A chill without rise of temperature has no important pathological significance.

NURSE'S RECORD—For the first week or more after labor keep a concise daily record of the case, according to the form on pages 24 and 25. Begin each day's report upon a new page or folio. Keep it filled out to date in readiness for the doctor's inspection.

A brief summary of the essential facts at the end of each day's record facilitates the doctor's examination.

NURSE'S DAI

NAME OF PATIENT_____

_____, 19__

Hour.	Pulse.	Temp.	Micturition.	Defecation.	DIET.	LOCHIA. Amount, Color, Odor, Clots.

LY RECORD.

DAY SINCE CONFINEMENT.....

BREASTS and NIPPLES.	CHILD. Pulse, Temp., Micturition, Defecation, Sleep.	REMARKS.

CARE OF THE MOTHER.

GENERAL RULES—The patient should lie on the back for the first few hours after labor. Later the posture should occasionally be changed.

Sleep relieves the exhaustion following labor, and should be promoted by quiet and by moderately darkening the room.

During the first week, as a rule, visitors should be excluded.

No medicine should be given without instructions.

In case of excessive flowing, give the patient a half teaspoonful of fluid extract of ergot every half hour till the flooding is controlled; stimulate contractions of the womb by putting the child to the breast, and by manipulating the uterus as directed on page 18, and send at once for a physician.

Advise the doctor immediately of any important abnormal occurrence in childbed.

The nurse should sleep on a separate cot in the same room with the patient.

CLEANLINESS—Absolute cleanliness of the

person, the clothing and the bedding of the patient is imperative.

A general bath may be given daily with a clean wash-cloth and warm water or alcohol and water.

Replace the lochial guard with a fresh one every three to six hours during the first three days, and at all times often enough to prevent the slightest bad odor.

The external genitals and their immediate surroundings should be cleansed thoroughly with one of the antiseptic solutions when the vulvar dressing is changed.

This may be done mainly by flushing. A douche-pan is placed beneath the patient's hips, and a stream of the warm solution is allowed to flow over the external genitals.

If the mercurial solution irritates a milder antiseptic may be chosen. A saturated, boiled solution of boric acid may answer. Permit no fetor.

Vaginal douches should not be used unless ordered.

Allow nothing to touch the genitals that has not first been sterilized.

Soiled lochial guards and all soiled linen should immediately be removed from the room.

THE DIET, especially if the patient is much exhausted, or has taken an anesthetic, may be

liquid or light solid food for the first day or two, *e. g.*, milk, gruels, beef essence, animal broths, dropped or soft-boiled eggs, oatmeal mush or wheaten grits, dry toast, and weak tea or cocoa.

Thereafter, in the absence of exhaustion, fever, bad digestion, or loss of appetite, a moderately full diet may be allowed as a rule.

CARE OF THE BREASTS AND NIPPLES—In simple engorgement of the breasts gentle massage with oiled hands, rubbing from the base toward the nipple, is permissible if it relieves pain.

An inflamed breast must not be rubbed.

Support by means of a firm compression binder is useful in over-distention. A padding of cotton-wool should be used under the binder to distribute the pressure evenly over each breast. An opening is made in the center of each pad to prevent injurious pressure on the nipples.

When but one breast is affected, support is best applied by means of a roller bandage.

The patient should take liquids sparingly while the breasts are engorged.

The nipples should be cleansed after each nursing, best with a weak antiseptic solution, *e. g.*, a saturated solution of boric acid in water, or the peroxid of hydrogen.

The nipples must be handled only with aseptic hands and must be protected against every possible septic contact. They may be infected by hands that have recently been soiled with lochia.

Excoriations, fissures or undue sensitiveness should at once be reported to the physician.

THE BLADDER—The bladder should empty itself within six or eight hours after delivery, and every eight hours subsequently.

Retention of urine may sometimes be relieved by suprapubic pressure, hot fomentations to the vulva, the sound of running water, rectal injections of warm water, or, with the doctor's permission, by allowing the patient to sit upon the bed-pan, or to get out of bed and use the commode for voiding the urine.

Flush the external genitals with sterile water after urination.

Do not use the catheter without consulting the attending physician.

THE BOWELS—The bowels should be opened on the second or third day and once daily thereafter.

Usually this may be accomplished by an enema of a quart of warm water, or of one or two ounces of a saturated solution of Epsom salt, repeated as required. A rectal injection of two tablespoonfuls of clear glycerin pre-

viously warmed or a glycerin suppository may be used; or a simple laxative may be given by the mouth, *e. g.*, citrate of magnesium solution.

DURATION OF LYING-IN—During the first week the patient should sit up in bed only with the consent of her physician.

In ordinary cases she may sit erect in bed after the first one or two days during meals or for bladder or bowel evacuations.

She should as a rule maintain a reclining posture on the bed or lounge for all or the greater part of the second week;

May in normal cases occupy her chair for the larger part of the day during the third week;

May have the liberty of her room during the fourth week;

May leave her room at the end of a month unless otherwise directed.

USE OF THE CATHETER—The instrument for the nurse's use should be a soft rubber, velvet-eyed catheter in good order.

It is boiled for ten minutes just before using.

The hands are cleansed as directed on pp. 35 and 36 before handling the sterilized catheter.

The patient lies on the back with the knees drawn up and well apart.

The patient or an assistant retracts the labia

so as to fully expose the orifice of the urethra and holds them apart till the catheter is passed.

The urethral orifice and the surrounding surfaces are cleansed with soap and warm water followed by one of the mercurial solutions and flushed with sterilized water.

The catheter is lubricated with vaselin recently sterilized by heating.

It is passed with the aid of the eye about one and a half inch, or until the urine begins to flow.

The urine is collected in a cup or small bowl.

Entrance of urine into the vagina and its contact with genital wounds are prevented.

The external genitals are flushed with sterile water after catheterizing.

The instrument is cleansed carefully after using.

The evacuation of the bladder is repeated once in eight hours.

PREVENTION OF CHILDBED INFECTION.

Childbed infection is caused by the invasion of the genital wounds by living micro-organisms or germs.

The carriers of the disease germs are in practically all cases the hands of the doctor or the nurse, instruments, utensils or other appliances brought in contact with the genitals.

Instruments, appliances, etc., and practically even the hands may be made germ free by proper aseptic and antiseptic measures.

Childbed infection is, therefore, preventable.

Prevention depends upon keeping everything that comes in contact with the birth canal germ-free or aseptic by the faithful use of antiseptic agents, especially during the labor and for at least two weeks after delivery.

The following are the best germ-destroying or

ANTISEPTIC AGENTS.

Moist Heat, Boiling or Steaming for ten minutes, or longer.

Dry Heat at 250° to 300° F. for ten minutes to two hours (baking in an oven).

Bichlorid of Mercury Solution — Bichlorid of mercury, eight grains, tartaric acid forty grains, boiled water, one quart.* (This is a deadly poison.)

The Peroxid of Hydrogen—15 volume solution, in full or half strength.

Chlorinated Soda Solution — Labarraque's Solution, of good quality, one ounce in ten ounces of water.

Carbolic Acid, one ounce, and glycerin, one ounce, in eighteen ounces of water; not so good as the preceding.

Formaldin Solution, one in five hundred.

CHOICE OF ANTISEPTICS—For cloths, linen, hand-brushes and most other utensils, any of these agents may serve; except the chlorinated soda. The latter is destructive of fabrics.

For dressings, cheese cloths, gauze, sponges, towels, sheets and the like, steaming at from 212° to 300° F. is best.

For rubber gloves, rubber douche bags and rubber sheets, boiling in plain water or salt solution should be preferred.

For metallic instruments and hand brushes, boiling is best. A teaspoonful of washing soda or baking soda to the pint of water in which

* Tablets containing the required chemicals may be had of the druggists.

steel instruments are boiled prevents rusting, and increases the rapidity of disinfection.

For hand basins, douche pans, and similar utensils, baking in an oven answers well.

Steaming or boiling is the only strictly reliable method of disinfection for general use.

For the hands either the bichlorid of mercury, the formaldehyde or the chlorinated-soda solution should be used.

How to Compute the Strength of Solutions—For making a solution of definite strength it will be convenient to remember that an ounce of water contains approximately 500 minims, and that a strength of one grain to the ounce of water is 1 in 500; one grain in two ounces is 1 in 1000; one grain in four ounces is 1 in 2000, and so on. This, while not exact, is sufficiently so for practical purposes.

It will also be seen that five grains to the ounce makes a one per cent. solution, ten grains to the ounce a two per cent. solution, and so on. In case of liquid antiseptics minims are substituted for grains.

Nurse's Clothing—The nurse should wear wash-dresses. Her clothing should at all times be absolutely clean.

Special protection is afforded during the labor by wearing a clean operating gown; if

possible this may be fresh from the steam chamber.

Care of the Hands—The nurse should keep her hands scrupulously clean and the nails cut short.

Special cleanliness is necessary in contact with the external genitals or the nipples of the mother and with the navel wound of the child.

The hands should be cleansed by one of the following methods immediately before they are to be used about the genitals of the obstetric patient or the child's navel.

Hand Disinfection.

a. Usual Method.

1. The nails are cleaned dry.

2. The hands and forearms are brushed systematically for at least ten minutes with hot water, soap and a hand-brush which has been sterilized by steaming; special attention is paid to the nails and finger-tips. The soap and water scrubbing is finished in running water or in two or three changes of water.

3. The hands are then rinsed in clean water.

4. Finally, they are immersed in a 1 in. 2000 bichlorid or a 1 in. 500 formaldehyde solution for five minutes.

b. PERMANGANATE METHOD.

Steps 1, 2 and 3 as in foregoing method.

4. The hands and forearms are immersed for three minutes in a warm saturated solution of permanganate of potassium in boiled water.

5. They are next immersed in a warm saturated solution of oxalic acid in boiled water till the permanganate stain is discharged.

6. They are rinsed with sterilized water.

7. Are held for five minutes in a bichlorid of mercury or formaldehyde solution, 1-500.

The permanganate process is advised for sterilizing the hands after unusual septic exposure and whenever extra care is required.

FURTHER PRECAUTIONS.

The hands should be held for a moment again in the mercurial solution each time before touching the genitals, and be rinsed in the same frequently during the work.

After disinfection refrain from wiping the hands, or, if necessary, dry them on a sterilized towel; touch nothing that is not aseptic.

A pair of thin rubber gloves will frequently be found of service. They may be rendered sterile by boiling for ten minutes in plain water or a weak solution of common salt, while to completely and permanently sterilize the hands

is impossible. The hands, however, must be cleansed as carefully as though gloves were not used.

Cotton gloves if kept dry and changed occasionally afford some protection.

Rubber gloves may be worn during unclean contacts also, to protect the hands against infection.

The advantage of the gloves for numerous uses is obvious.

To keep the hands soft after the use of antiseptics, wash in plain hot water, rub well with glycerin and water, and wipe dry.

THE CHILD.

NATURAL HISTORY AND DEVELOPMENT.

MEASUREMENT—Average length or height at birth, 18 to 20 inches.

Average gain in height first year, 8 inches.

Average gain in height second year, 3⅛ inches.

Average gain in height third year, 3 inches.

Average gain in height fourth to sixteenth year, 2 to 3 inches yearly.

WEIGHT—Average weight, at birth, 7 to 7¼ lbs.

Gain for the first six months, 4 to 7 ounces or more weekly.

During the remainder of the first year the weekly gain is somewhat less.

Weight at the end of one year, three times the birth weight.

While the rate of gain is not constant the average monthly gain in the first year is one pound or little more.

During the second year the gain is about six pounds;

During the third, four and a half pounds;

During the fourth and the fifth years each four pounds.

PULSE-RATE, at birth, 120 to 140.

One year, 120;

One to two years, 120 to 110;

Two to six years, 110 to 100;

Six to ten years, 100 to 88;

Ten to fourteen years, 88 to 72.

Frequently the pulse of the newborn infant is irregular while the child is awake; it is best counted during sleep.

RESPIRATION, at birth, 45 per minute;

One year, 30 per minute;

Two to five years, 30 to 20 per minute.

TEMPERATURE in the rectum first week, 99.6° F.;

First week to fifth month, 98½° to 99° F.

During the first five months the temperature is subject to fluctuations of from 1° to 3° F.

The axillary temperature is one degree or more lower than the rectal.

DEVELOPMENT — The caput succedaneum disappears within about twenty-four hours. The head resumes its shape in two or three weeks.

Second month, generally, the eyes and hair begin to change color.

Third month, the child begins to use its hands for grasping; holds up its head.

Fourth month, begins to know faces and to sit upright.

Fifth month, saliva begins to be secreted freely.

Sixth month, sits erect easily.

Seventh month or a little earlier, first dentition begins.

Eighth month, begins to creep.

Ninth month can stand with help.

Ten to sixteen months, begins to talk.

Twelve to eighteen months, begins to walk.

Eighteen to twenty months, large fontanelle closes.

The rate of development is more rapid in girls than in boys.

FIRST DENTITION—The first or milk teeth are twenty in number.

The first dentition begins at about the sixth or seventh month.

The order of eruption is generally as follows, but is subject to variation:

Two lower central incisors, six to seven months.

Four upper incisors, eight to ten months.

Four first molars and inferior lateral incisors, twelve to fifteen months.

Four canines, eighteen to twenty-four months.

Four remaining molars, twenty to thirty months.

SECOND DENTITION—The second or permanent teeth are thirty-two in number.

The second dentition usually begins at the sixth year. The average times of eruption are:

Four first molars, sixth year.

Four middle incisors, ninth year.

Four lateral incisors, tenth year.

Four first bicuspids, ninth year.

Four second bicuspids, tenth year.

Four canines, thirteenth year.

Four second molars, twelfth to fourteenth year.

Third molars, twenty-first year.

CARE OF THE CHILD.

ON BIRTH cleanse the face and especially the eyes, the latter preferably by flushing with a 1 :4000 bichlorid of mercury solution; dry the eyes thoroughly.

Rub the skin with aseptic sweet oil or vaselin to facilitate the subsequent removal of the cheesy matter.

Wrap the child in flannel and keep it warm.

Within a few hours after birth inject a tablespoonful of warm water into the rectum to provoke movement of the bowels, if necessary in order to make sure that the rectum is pervious.

BATHING—Feeble children should not be bathed for several hours, and in some cases, days, after birth. Rub daily with sweet oil instead.

A vigorous infant may receive its first bath shortly after birth.

Wet the head first, then immerse the body, supporting the head above the water with the hand during the bath.

The bath tin may be covered with flannel or

the child be wrapped in flannel if necessary to prevent shock or fright on immersion.

The best time for the bath is a morning hour midway between feedings.

Use an infant's bath-tub. Place it near the heater, or where the temperature is about 75° F.

For a new-born infant the temperature of the water should be 98° F. by the bath thermometer.

Duration of bath should not exceed five minutes.

A soft, fresh-boiled wash-rag is cleaner and better than a sea sponge.

The *finest quality* of Castile or some equally bland soap is best. It should be used sparingly.

Cleanse the scalp thoroughly.

Dry the child rapidly by enveloping in the towel with but little friction. During the first week or two the skin is irritable and is easily injured by chafing.

In older infants moderately brisk friction with the bare hand may be used after drying the skin, to secure full reaction.

The newborn child should not be exposed to the slightest chilling.

Infant powder is usually unnecessary.

In case of irritation in the folds of the skin,

finely powdered talc, or oxid of zinc and lycopodium in equal parts, may be used as infant powder.

Repeat the bathing daily.

Cleanse soiled portions of the body as often as soiled.

The temperature of the bath may be reduced gradually to 90° F. by the age of six months if the child is robust.

After three years sponging may be substituted for immersion. Temperature of bath may be 75° to 85° F.; at the age of approaching puberty it may be 70° to 75° F. or lower if satisfactory reaction follows.

In feeble children the addition of salt to the bath water, to the strength of sea water, helps to stimulate the cutaneous circulation.

Never bathe the child when it is in a perspiration or is chilled.

Navel Dressing—Wrap the stump of the navel-cord with aseptic absorbent cotton which may be dry or wet with alcohol, and lay to the left side.

Powders are objectionable; they may hinder desiccation of the navel cord stump.

Hold the dressing in place with a loose belly-binder of thin, soft flannel. Discard the binder after the navel wound heals.

Avoid wetting the stump of the navel cord

and after each bath re-dress it; or, after the first bath, rubbing the child with sweet oil may be substituted for bathing till the cord falls. This usually happens about the fifth day.

Keep the navel wound surgically clean. The nurse's hand should be cleansed carefully before each dressing of the cord (p. 35).

If the cord develops a fetid odor immediately notify the doctor.

CLOTHING—The following articles should be provided: A soft flannel blanket to wrap the child in, three dozen napkins of cotton bird's-eye diaper 20 inches wide, three dozen 22 inches wide.

Six soft, thin flannel belly-bands each four inches wide and long enough to encircle the body and overlap four inches; they may be provided with tapes for fastening in front.

A knit wool or silk and wool band which can be had ready-made may be used.

Six flannel or silk and wool undershirts of the softest material, without sleeves.

Six fine flannel slips with high neck and long sleeves, of Gertrude pattern, and about twenty-five inches in length.

Ten muslin slips of same pattern and length as flannel slips.

Six pairs of woolen socks reaching to the knees.

All clothing, including the belly-band, should be loose enough to admit easily two or three fingers underneath it.

No garment should be worn till properly laundered.

An entire change of clothing is to be made at night. The day dresses are replaced with a single flannel or canton flannel slip having a drawing string at the bottom.

In all seasons, children of whatever age should wear woolen garments next the skin, and the extremities should at all times be as warmly covered as other portions of the body are.

The dresses are to be shortened when the child begins to creep, or earlier.

Shoes should be worn from the time the child begins to walk. They should be firm enough for the necessary protection and support, and large enough to provide for the full expansion of the feet.

THE NAPKIN should be removed immediately when wet or soiled and replaced with a clean one, fresh laundered. Bathe the soiled portions of the body at each change, using plain warm water without soap.

An excellent material for napkins is a soft cheese cloth which has been boiled and dried. It should be folded to several thicknesses;

should be used but once; may be burned after using.

NURSING—No artificial food should be fed to the newborn infant unless ordered. A teaspoonful of warm water, plain or slightly sweetened with milk sugar, may be given at intervals of an hour or two. Giving catnip, anise or similar herb teas is wrong.

Put the child to the breast after the mother has rested, six or eight hours after birth. Ten or fifteen minutes should suffice for each nursing.

Let it nurse once in four hours until the milk comes, then once in two hours. Lengthen one interval in the night to six hours. Both breasts may be nursed at each nursing.

Gradually increase the intervals to about three hours by the age of three months.

The harm done by irregular nursing is a two-fold one.

Digestion is hindered by feeding one meal before the preceding meal is disposed of;

The mother's milk becomes too rich with too frequent nursing and too thin when the intervals are too long.

The breast milk alone is rarely sufficient for the child's nutrition after six or eight months. If needed, one artificial feeding daily may then be added to the nursing and the number of

hand feedings be increased gradually till the child is wholly weaned.

The usual time for weaning is when the child has eight teeth, or about the twelfth month.

The best evidence of imperfect nutrition is failure of the normal weekly gain in weight.

SLEEP—The infant should sleep by itself in a crib or cradle.

During the first two or three months of its life the child requires eighteen or twenty hours, at two years of age about fourteen, and at three years, eleven hours of sleep out of the twenty-four.

THE BOWELS for the first two years should move twice, not more than four times daily.

A small soap, cacao butter or a glycerin suppository, or the injection of a teaspoonful of warm glycerin into the rectum may be used as required in case of constipation.

Five to ten grains of manna or of phosphate of sodium or both may be given in water once or more daily if needed as a laxative.

Phillips' milk of magnesia is an excellent aperient for infants. The dose is from a half to one teaspoonful or more.

THE BLADDER is emptied from five to ten times daily during the first months.

The urine is at first very limpid and of a

low specific gravity. The daily amount in the first year is from eight to twelve ounces.

USEFUL HINTS — Premature and feeble children require special care to keep them constantly warm.

One to three ounces of water, previously sterilized by boiling, may be given daily throughout infancy.

Should the child's breasts become swollen no treatment as a rule is required. On no account should the nurse manipulate or poultice them.

Notify the doctor of the slightest discharge from the eyes.

The temperature of the child, taken in the rectum, may afford important information.

The position of the child should be changed occasionally.

The infant may be taken out of doors for a few hours daily in suitable weather, after the first month in summer, the fourth in winter.

The child's habits will be in great part what the nurse makes them. Enforce system.

CARE OF THE TEETH—If at any time the teeth, even of the first set, show signs of decay they should be placed in the care of a competent dentist.

It is well in any event to submit the teeth

to the systematic inspection of the dentist two or three times a year.

An examination should be made by the mother or the nursery maid as a part of the child's daily toilet.

If tartar accumulates it should be removed by rubbing the teeth with a soft moist muslin rag, or with a wooden toothpick frayed out at the end. Care must be used not to injure the gums.

The spaces between the teeth may be cleansed once or twice daily by drawing a soft silk thread through them.

HYGIENE OF THE NURSERY—The nursery should be a large, well ventilated, dry room above the ground floor and with a sunny exposure.

Its furniture should be simple and such as may easily be kept clean.

The walls and the wood-work may be painted or varnished, the floor may best be of hard wood covered with rugs instead of carpets.

The plumbing, if any be allowed, must be of the best sanitary construction and the drains should be flushed several times daily.

The temperature of the room may be 68° to 70° F., day and night.

COMMON ILLS OF INFANCY—*Restlessness*

and crying are most frequently signs of disease, sometimes of hunger.

Eructation of food immediately after feeding is the overflow of a too full stomach.

Eructations some time after feeding are due to indigestion.

Regurgitation of food with small and too frequent stools may result from too much fat in the food; greenish and acid stools from food too concentrated or too sweet.

Constipation is sometimes the result of too little fat or sugar in the food.

Colic may be due to too large a percentage of proteids in the food, sometimes to excess of fat or of sugar.

Warmth to the abdomen and gentle massage are harmless and useful remedies for colic.

Irrigation of the bowel with a quart of water at a temperature of 110° F. and containing a teaspoonful of common salt helps. Two small soft rubber catheters are passed into the rectum; the salt solution is injected very gently through one and flows out through the other.

A tablespoonful of warm milk of asafœtida injected into the bowel or a teaspoonful by the mouth usually relieves.

Worms—The only reliable sign of worms is the passage of worms or of their eggs.

Sleeplessness is a common result of indigestion.

Convulsions are most frequently due to indigestion. While waiting for the doctor put the child in a warm bath at 105° F. for five minutes and move its bowels freely by rectal injections of warm water.

Teething is a natural process, and not a disease; is seldom a cause of disease.

ARTIFICIAL FEEDING—DIETARY OF INFANCY AND EARLY CHILDHOOD.

FIRST TWELVE MONTHS.

In substitute feeding cow's milk should be the basis of the food for the first year and a half of life.

Mixed dairy milk is better than one cow's milk because of a more nearly constant quality.

Raw milk, if clean and pure, is better than milk which has been sterilized by heat.

Heating to high temperatures impairs the nutritive value of the milk.

Heating to 150° F. works a minimum of injury and is sufficient for partial sterilization.

This may be practised only when the keeping quality of the milk cannot otherwise be trusted.

Milk which is free from the usual impurities of commercial milk, which was chilled within a few minutes after milking, and which has been kept at a temperature constantly below 50° F. needs no sterilizing.

Such milk may be had in many of the larger

cities from special dairies conducted in the interest of infant feeding.*

Milk tablets for testing the freshness of milk may be had of the druggists and of the Cereo Company of Tappan, N. Y.

Directions for Modifying Cow's Milk.

The milk is bottled at the dairy.

The cream will be contained in the upper third of the bottle after standing four to six hours on ice.

Generally it should be found in the upper third of the bottle as delivered to the consumer.

For feeding during the first three months of life take the top ten ounces from a quart bottle on which the cream has risen.

The ten ounces thus removed it will be seen is a mixture of cream and milk. It is spoken of as ten-ounce top milk.

The top milk should be removed from the bottle with care, not to disturb the under milk.

This is best done by ladling it off with a small ladle or dipper.†

In the absence of a suitable dipper the top

* The Walker Gordon, N. Y., and the Certified Milk Co., N. J., supply milk of suitable purity for infant feeding.

† A one-ounce dipper specially devised for the purpose by Dr. Henry Dwight Chapin, may be had of the Cereo Co., Tappan, N. Y.

milk may be decanted off or the under milk may be removed by means of a syphon.

From the ten-ounce top milk after stirring to insure uniform quality the quantity required for the day's feeding is measured off.

At birth three ounces of ten-ounce top milk are mixed with twenty-one ounces of sterilized water or of dextrinized gruel.

The water or gruel thus used is termed the *diluent.*

The water is sterilized by boiling 20 minutes or more.

Generally, dextrinized gruel is the better diluent. In exceptional instances water agrees better.

Dextrinized gruel is prepared as follows: Two tablesponfuls of barley or wheat or rice flour are rubbed to a thin paste with cold water. This is stirred into a quart of hot water and boiled for twenty minutes.

On cooling to blood heat two teaspoonfuls of Cereo or of Forbes' diastase or of some similar preparation are added. The whole is well mixed and allowed to stand ten minutes.

To each 20 ounces of the mixed food two and a half even tablespoonfuls of milk sugar are added.

The milk sugar should be the purest obtain-

able. It is best dissolved in the diluent before adding to the milk.

Finally to each 20 ounces of the food one ounce of lime water is added.

The strength of the food is increased by gradually reducing the proportion of the diluent as rapidly as the child's digestion permits; by the end of the third or fourth month the ratio of the diluent to top-milk should be 2 : 1.

After the third or fourth month twelve-ounce top-milk is used. Of this twelve ounces are diluted with twenty ounces of dextrinized gruel or sterilized water. To this are added one and a half ounce of milk sugar and one and a half ounce of lime water.

After the sixth month the top sixteen ounces from the quart bottle—sixteen-ounce top-milk —are used.

Twenty ounces* of the sixteen-ounce top-milk are diluted with twenty ounces of dextrinized gruel; two ounces of milk sugar and two of lime water are added.

After the tenth month, twenty-eight-ounce top-milk is used. To forty-two ounces of this six ounces of plain or dextrinized gruel, two

*Twenty ounces are taken from the top of each of two bottles and mixed. The required number of ounces is then measured from this.

and a half ounces of lime water are added.

The following tabular statement of the foregoing formulas may be found convenient for reference:

FORMULAS FOR MODIFIED MILK.

FIRST WEEK.

Ten-ounce top milk.....	3 ounces
Boiled water or dextrinized gruel..	21 "
Milk sugar.....	1 ounce
Lime water.....	1 "

AFTER THE THIRD OR FOURTH MONTH.

Twelve-ounce top milk.....	12 ounces
Dextrinized gruel or sterilized water	20 "
Milk sugar, about 4 tablespoonfuls.	1½ ounce
Lime water.....	1½ "

AFTER THE SIXTH MONTH.

Sixteen-ounce top milk.....	20 ounces
Dextrinized gruel.....	20 "
Milk sugar	2 "
Lime water.....	2 "

AFTER THE TENTH MONTH.

Twenty-eight-ounce top-milk.....	42 "
Gruel plain or dextrinized....	5 to 10 "
Lime water.....	2½ "

WHEY, AND WHEY MIXTURES.

Whey is generally well borne by weak stomachs and may serve as a suitable food for several days when the child's digestion is feeble.

To make whey. To a pint of milk warmed to 115° F. add a junket tablet or one or two teaspoonfuls of essence of pepsin (Fairchild) or fifteen drops of liquid rennet. After standing a half hour, cut the curd in small pieces and strain off the whey through two or three thicknesses of cheesecloth or through a wire gauze strainer.

When a little richer food is required stir the curd briskly before straining.

The following whey and cream mixtures afford a very digestible food of sufficient nutritive value for the first two or three months. No. 2 is stronger than No. 1 and should be preferred if well borne.

WHEY AND CREAM MIXTURES.

1. Whey* ..... 18 ounces
   Cream (six-ounce top-milk)... 3 "
   Milk sugar, 2 tablespoonfuls.... ⅔ ounce

* The whey may be prepared from the under milk from which the cream or top milk has been removed.

2. Whey ..... 20 ounces
Cream (six-ounce top milk).... 5 "
Milk sugar, two tablespoonfuls.. ⅔ ounce

The whey should be heated to 150° F. for one or two minutes to kill the ferment before adding the cream, otherwise the cream will be curdled.

The proteid strength of the food may be increased, if needed, by adding white of egg.

The white of one egg to a pint of food adds approximately 1 per cent. of proteid. This proportion of egg albumin is usually well borne even by new born infants. Should the stools be putrid the proportion must be reduced.

3. The top fourth is removed from the bottle of milk. Whey is prepared from the under three-fourths. The whey is heated to 150° F. and after cooling is mixed with the top milk. [This is Bartley's formula.]

The attending physician should be consulted with reference to the selection of the food and the regulation of the feeding.

BOTTLING—The food mixture should be prepared and distributed in nursing bottles soon after the milk is delivered, in quantity sufficient for the day's use. Ten clean bot-

tles* are filled to the shoulders, each holding enough for one feeding.

PASTEURIZATION — If pasteurizing is required proceed as follows: Plug the mouths of the bottles lightly with rubber stoppers. Rubber stoppers specially made for the purpose may be had of the druggists.

Stand the bottles in a kettle and cover to the shoulders with water. Heat to 150° F. for twenty minutes. Push the stoppers in firmly. Chill the bottles promptly and keep on ice.

The same object may be reached by rapidly heating the milk nearly to the boiling point and then promptly chilling.

FEEDING—Warm the bottle to 95° F. before feeding, then remove the stopper and slip a clean rubber nipple over the neck of the bottle.

Let the child nurse directly from the bottle in which the food was prepared.

Cleanse the nipple inside and out after each feeding and the bottle in like manner.

Boil the nipple for ten minutes before using and the bottles before refilling.

* Or as many as the number of daily feedings.

AMOUNT AND FREQUENCY OF FEEDING—RULES FOR GENERAL GUIDANCE.

Age.	Intervals of Feeding.*	Amount at Each Feeding.†	Number of Daily Feedings.
First day	2 hours.	1 drachm.	10
Second day	2 hours.	½ ounce.	10
Third day	2 hours.	1 ounce.	10
Second week	2 hours.	1½ ounce.	10
Six weeks	2½ hours.	2½ ounces.	8
Three months	3 hours.	3½ ounces.	7
Four months	3 hours.	4½ ounces.	6
Five months	3 hours.	5 ounces.	6
Six months	3 hours.	5½ ounces.	6
Seven months	3 hours.	6 ounces.	6
Eight months	3 hours.	7 ounces.	6
Nine months	3 hours.	8 ounces.	6
Ten months	3½ hours.	8½ ounces.	5
Eleven months	3½ hours.	8¼ ounces.	5
Twelve months	3½ hours.	9 ounces.	5

* Lengthen one interval in the night to six hours.

† By measuring-glass.

Small and feeble children require smaller quantities, large and robust children larger quantities than the foregoing table prescribes. The daily allowance needed must be determined for the individual case by trial.

The stomach capacity at birth is approximately $^1/_{100}$ the weight of the child's body. It averages about one ounce at birth and increases by a drachm and a half to two drachms per week during the first six months. After that the rate of increase is somewhat smaller.

Take the child's weight once a week as a guide to the feeding. A well nourished child

gains five ounces or more weekly during the first five months. For the remainder of the first year, the gain is about a pound a month.

The birth weight is doubled at four months and trebled at twelve.

PEPTONIZED MILK may rarely be used as a temporary expedient for feeding infants of very feeble digestion.

Peptonize the contents of each bottle shortly before feeding, as follows: For each ounce of the mixture add extract of pancreas* (Fairchild), one-fifth grain; bicarbonate of sodium, three-fifths grain,† and shake till dissolved.‡ Stand the bottle in water at the temperature of 105° F. for ten minutes. If the milk becomes bitter, reduce the time to ten or even to five minutes.

MILK LABORATORIES.

The milk laboratory is to the nursery what the pharmacy is to the sick-room. The physician writes his prescription for the infant's food very much as he does for medicine. The

* To be had of the druggists.

† Omit the lime water, when bicarbonate of sodium (baking soda) is used.

‡ Fairchild's peptonizing tubes will be found convenient. They contain the extract of pancreas and the soda mixed in the required proportions.

laboratory fills the prescription and dispenses the product for consumption.

At the milk laboratory cow's milk is resolved into its principal nutritive constituents and these are re-combined in such proportions as the physician may direct. The proportions may conform to those of breast milk or be still further modified if needed to suit the individual case.

SAMPLE FOOD PRESCRIPTIONS—1. For a healthy and fully developed infant one week old:

Proteids	.50*
Fat	1.50
Milk sugar	5.00
Lime water.....	5.00

Heat to 150° F.

Send 10 bottles, each 1½ ounce.

Constipation is generally relieved by raising the percentage of fat, which, however, should not usually exceed 5 per cent.

2. For a child three months old with very weak proteid digestion:

Proteids	.20
Fat	3.50
Milk sugar	6.50
Lime water.....	5.00

* The numerals in the formula represent percentages.

It is to be assumed that the proportion of proteids needs reduction toward the minimum, so long as undigested curds appear in the stools. Partial peptonizing may in rare cases also be required for a time. The proteids are again to be raised to the norm as fast as the child's digestive powers will permit. Yet it is better, generally, to add too little than too much of this ingredient.

3. For a child three months old, with weak fat digestion:

Proteids	1.50
Fat	.10
Milk sugar	6.50
Lime water	5.00

4. For an infant three months of age with feeble sugar digestion:

Proteids	1.50
Fat	3.50
Milk sugar	2.20
Lime water	5.00

The last three prescriptions are intended only to give a general idea of the method of treating impaired digestion. The degree and character of the digestive disorder, the appearance of the stools, and the weight of the child weekly

serve to point out the modifications required in the individual case (see page 51).

The following table shows approximately the stomach capacity of the child and the percentage of proteids, fat and sugar required at different periods of the first year for healthy infants, substantially as determined by the experience of the milk laboratories of New York and Boston.

AMOUNT AND STRENGTH OF FOOD.

Age.	Stomach Capacity.	Proteids.	Fat.	Sugar.	Lime-water.
Premature infants.....	2 to 6 drachms..	.20 to .75	1.00 to 1.50	3.00 to 5.00	5.00
Full-term Healthy Infants.					
1 week	1 ounce.....	.50	1.50	5.00	5.00
2 weeks	1⅛ ounces.....	.75	2.00	5.00	5.00
3 weeks	2 ounces.....	1.00	2.50	6.00	5.00
4 to 6 weeks.....	2½ to 3 ounces....	1.00	3.00	6.00	5.00
6 to 8 weeks.....	3 to 3¼ ounces ...	1.00	3.50	6.50	5.00
8 to 16 weeks.....	3¼ to 4¼ ounces..	1.50	3.50	6.50	5.00
16 to 24 weeks.....	4½ to 5¼ ounces..	1.50	4.00	7.00	5.00
24 to 32 weeks.....	5¼ to 7 ounces....	2.00	4.00	7.00	5.00
32 to 34 weeks.....	7 ounces.....	2.00	4.00	7.00	5.00
34 to 36 weeks.....	7½ ounces.....	2.25	4.00	7.00	5.00
36 to 40 weeks.....	7 to 8 ounces.....	2.50	4.00	6.50	5.00
40 to 44 weeks.....	8 to 8½ ounces....	3.00	4.00	5.00	5.00
44 to 48 weeks.....	8 ½ounces.....	3.50	4.00	4.50	5.00
48 to 52 weeks.....	9 ounces.....	4.00	4.00	4.50	5.00

Percentage Feeding in Domestic Practice.

When laboratory feeding is not available a fairly accurate percentage-feeding is possible in home modification.

As in any method of artificial feeding the regulation of the food should be trusted only to the skilled judgment of the physician.

Yet the following facts may be of interest to nurses and mothers who care to know something of the theory of infant feeding.

The table on p. 65 affords the data for food formulas of the required percentages at different periods throughout the first year of infancy.

Human milk contains in round numbers 1 to 2 per cent. of proteids, 3 to 4 per cent. of fat and 7 per cent. of sugar.

Average cow's milk contains approximately 4 per cent. of each of these ingredients.

"Top milk" of whatever grade contains the same percentage of proteids and of sugar as the whole milk, about 4 per cent. of each.

The percentage of fat in top milk varies with the grade of top milk.

Since the cream is practically all found in the upper third of a bottle that has fully creamed, the top third will contain 3x4, or 12 per cent. of fat;

The top half 2x4. or 8 per cent. of fat;
The top two-thirds 3x4÷2, or 6 per cent. of fat, and so on for any other fractional part of a bottleful exceeding six ounces.*

In a bottle that has fully creamed the top 6 ounces is cream. Complete separation of the cream is shown by a plainly visible line of demarkation between the cream and the under milk.

It will be seen that the ratio of fat to proteids may be regulated at will by the kind or grade of top milk used; the proteid and fat strength by the proportion of diluent added.

The quantity of sugar which must be added to bring the sugar percentage up to any required figure is readily computed.

For example, to prepare a food that shall contain 1 per cent. of proteids and 3 per cent. of fat, the top third of the bottle, essentially ten-ounce top milk, is used. This contains approximately 4 per cent. of proteids, 12 per cent. of fat and 4 per cent. of sugar.

It is diluted four times by adding thirty ounces of the diluent to ten ounces of the top milk.

The result is a mixture containing 1 per cent. of proteids, 3 per cent. of fat and 1 per

* This method of computation, though not exact, is sufficiently so for practical purposes.

cent. of sugar. To raise the sugar to 6 per cent., 5 per cent. of sugar is added, or one ounce to every twenty of the mixture; to raise it to 7 per cent., 6 per cent. of sugar is added, or a little more than one ounce to twenty.

Diluents—Dextrinized gruel is generally a better diluent than water, for the reason that it modifies the curd formed in the child's stomach, making it finer and more flocculent. It thus renders the casein more digestible. It also hinders the putrefaction of the milk in the digestive tract. Whey, too, is a good diluent.

The Value of Whey—Whey contains nearly 1 per cent. of proteids and .22 per cent. of fat. If the curd is stirred well before straining the fat in the whey is raised to 2 per cent.

The proteids of whey are much more digestible than casein, hence the advantage of whey mixtures.

An important difference between human milk and cow's milk lies in the fact that in human milk but one-sixth of the total proteids is casein, while in cow's milk four-sixths of the total proteids is casein.

In whey and cream mixtures a range of total proteids varying from .50 to 1.90 per cent. is possible, of which only about one-half is casein. The possible range of fat in such mixtures is

from 1 to 4 per cent. and of sugar from 4 to 7 per cent. (See p. 65.)

The use of whey as a diluent, therefore, affords a more digestible food than do ordinary diluents, such as water and gruel.

The maximum proteid strength of whey and cream mixtures, however, is insufficient after the first three or four months of infancy.

After that period top milk and dextrinized gruel should be substituted.

DATA FOR PERCENTAGE FEEDING IN DOMESTIC PRACTICE.

Age in Weeks.	Intervals of Feeding, in hours.	Number of Ounces at Each Feeding.	Kind of Top-Milk.	Number of Ounces of Top-Milk.	Number of Ounces of Dextrinized Gruel or Sterilized Water.	Number of Ounces of Milk Sugar.	Number of Fluid Ounces of Lime Water.
1..	2	1	Ten-ounce.	3	21	1	1
2..	2	1½	Ten-ounce.	3	15	¾	¾
3..	2	2	Twelve-ounce.	5	15	1	1
4 to 6..	2½	2½	Ten-ounce.	6	18	1¼	1¼
6 to 8..	2½	3¼	Nine-ounce.	8	24	1½	1½
8 to 16..	2½ to 3	4	Twelve-ounce.	12	20	1½	1½
16 to 24..	3	4½	Twelve-ounce.	15	25	2	2
24 to 32..	3	5	Sixteen-ounce.	20	20	2	2
32 to 34..	3	6	Sixteen-ounce.	22	22	2	2¼
34 to 36..	3	7	Eighteen-ounce.	27	21	2	2½
36 to 40..	3	7½	Twenty-ounce.	32	20	1½	2½
40 to 44..	3	8	Twenty-four-ounce.	36	12	1½	2 to 2½
44 to 48..	3	8½	Twenty-eight-ounce	42	6	0	2½
48 to 52..	3 to 3½	9	Whole milk.	48	7	0	2½

TWELVE TO EIGHTEEN MONTHS.

The child may take four or five feedings daily of whole-milk with gruel added in the proportion of one-eighth to one-fourth the

mixture. The gruel may be made with two to four tablespoonfuls of the flour to the pint. Two or three ounces of uncooked beef juice slightly seasoned may be given daily; it may be mixed with the milk or be given separately. It should be prepared twice daily or oftener. The beef must be of the best quality and be kept on ice. No food requiring mastication should be allowed till the child has sixteen teeth. A little junket or well cooked oatmeal or wheaten breakfast cereal may then be given once or twice daily. A soft boiled egg or an ounce of scraped beef may be allowed two or three times weekly.

EIGHTEEN MONTHS TO TWO YEARS.

If the child is hearty, a little fine cut meat may be given with the midday meal, such as tender beef, lamb or chicken. This, however, is not essential. Chicken or mutton broth may be added.

Milk should constitute a large part of the feeding till the child has all its teeth, and even longer. Milk, beef juice and the farinaceous preparations above mentioned afford a sufficient dietary for the entire period of infancy.

Four meals a day generally suffice.

Condensed milk and proprietary foods are not to be recommended.

TWO TO THREE YEARS.

The child may sit at the table. Add to the dietary fine cut beefsteak, roast beef, chicken, turkey, fresh fish, mashed potato, bread and butter, light puddings, sound, ripe fruits, in moderate quantity, especially freshly cooked fruits.

THREE TO FIVE YEARS.

Add omelet, oysters, lamb chops, mutton, chicken fricassee, beefsteak, tomatoes, peas, beans, occasionally stewed fruits, in season. Forbid tea, coffee, wine and beer.

MANAGEMENT OF THE BIRTH IN THE ABSENCE OF THE PHYSICIAN.

INSTRUCTIONS FOR THE NURSE.

When the head is apparently about to be born, in the absence of the doctor, place the patient upon her left side with her knees drawn up and her back near the edge of the bed.

Scrupulously cleanse your hands and arms as directed on pages 35 and 36.

Cleanse the patient's external genitals as in other cases.

Expose and watch the surface of the pelvic floor—the space immediately about the genitals and anus.

For several minutes, sometimes a half-hour or more, before the head is born the pelvic floor bulges outward, at least during the pains.

Internal examinations by the nurse are not as a rule advisable.

As soon as the head can be seen at the vulvar fissure place the fingers against it and hold it back during the pains enough to permit only a very gradual descent.

This gives time for the vaginal orifice to stretch and thus tends to save tearing.

In first labors a half hour or more will be required from the time the pelvic floor begins to bulge.

In subsequent labors fifteen or twenty minutes will usually suffice.

If the head is being driven down too forcibly hold it back with the hand pressed against the pelvic floor and ask the patient to avoid straining by breathing rapidly during the pains.

On birth of the head pass the finger within the passages to learn if the cord is wound about the neck.

If it is, pull the loop or loops of cord carefully down over the head.

See that the child's face does not lie in a pool of liquid.

Immediately on birth of the head place one hand flat upon the abdomen over the uterus. "Watch" the uterus with the hand upon the abdomen till child and placenta are delivered and for a half-hour longer, till the uterus can be felt to contract firmly.

On delivery of the trunk turn the patient upon her back and teach a bystander to watch the uterus temporarily.

If the uterus fails to contract properly apply

friction over the anterior wall with the hand held firmly on the abdomen or grasp the uterus firmly with one or both hands.

Make the child cry out by slapping its buttocks with the hand or with a wet towel.

If the child does not breathe let an assistant hold its body in a basin of water at a temperature of 98° F., with the head partially bent backward, keeping the mouth just above the water.

Cleanse the face and spread a clean, coarse towel over it.

Press one hand firmly over the child's stomach, close the nostrils with the other.

Applying the mouth over the child's mouth, force air into its lungs very gently through the intervening towel.

Repeat twenty times per minute.

Continue artificial respiration till the child breathes regularly.

Maintain the temperature of the water, in which the child is immersed, at 98° F.

Tie the cord only after it has nearly or quite ceased to beat at a point near the vulva.

Tie firmly an inch and a half from the navel.

Tie again an inch or two farther away.

Cut between the ligatures, near the first.

Press the end of the stump repeatedly with a fresh towel, to see if it bleeds.

Examine it occasionally for an hour or two, and if it oozes tie again just behind the first ligature.

If necessary, compel the uterus to contract, by friction or pressure, as directed on page 18.

Don't pull upon the cord.

When the placenta is expelled, twist the membranes into a rope by turning the placenta over and over gently till the membranes all come away.

Watch the uterus for at least a half-hour longer, to make sure that it contracts firmly.

GLOSSARY.

Abdomen, the belly; the cavity of the body bounded above by the diaphragm and below by the pelvic entrance.

Anesthetic, an agent for producing insensibility to pain.

Antiseptic, preventive of septic poisoning or infection.

Aseptic, free from septic poisoning and the germs which cause it.

Caput Succedaneum, the usual swelling observed at birth on the presenting part of the child's head.

Catheter, a tubular instrument used for drawing off the urine from the bladder.

Childhood, in the restricted sense of the term, is the period of life extending from infancy to puberty, approximately from two and a half to fifteen years of age.

Defecation, the act of evacuating the bowels.

Douche, a stream or jet of fluid projected against some part of the body for cleansing it or for remedial purposes.

Drachm, 60 grains, ⅛ ounce; in fluid measure, about a teaspoonful.

Fetus, the unborn child.

Fundus of the Uterus, the upper portion of the uterus above the level of the Fallopian tubes.

Genitals, the sexual organs.

Grain, the smallest unit of weight; in Troy or apothecaries' weight, $^1/_{480}$ part of an ounce. The ounce avoirdupois is equal to 437½ grains.

Hemorrhage, profuse bleeding.

Infancy, the period of life from birth to the completion of the first dentition, two or two and a half years.

Labia, lips; as applied to the external sexual organs, essentially the lateral halves.

Ligature, a thread or cord of silk or other material tied around a part for the purpose of constricting it.

Lochia, the discharge which takes place from the birth-canal for two to four weeks after labor.

Lochial Guard, the napkin or other dressing worn over the external genitals after labor to receive the lochial discharge.

Meconium, the dark greenish matter contained in the intestinal canal of the newborn child.

Micturition, the act of voiding urine.

Navel, the point near the center of the abdominal wall, at which the umbilical cord was attached during fetal life.

Navel-cord, or umbilical cord, the cord which connects the fetus with the placenta. It carries the vessels which convey blood to and from the fetus.

Ounce, 480 grains, 8 drachms, $^1/_{12}$ pound Troy or apothecaries' weight; 437½ grains, $^1/_{16}$ pound, avoirdupois; in fluid measure, $^1/_{16}$ pint; about two tablespoonfuls.

Pasteurize, to partially sterilize by exposure to a temperature of 167° F. for twenty minutes.

Pelvis, the bony basin at the lower extremity of the trunk.

Peptonize, to convert into peptone; to partially digest.

Perineum, the body of muscular and other structures between the lower end of the rectum and the vagina.

Placenta, the afterbirth.

Pubes, the prominent, central portion of the pelvis in front.

Puerperal Period, the period of about six weeks following labor.

Rectal, pertaining to the rectum.

Rectum, the lower or pelvic portion of the large bowel.

Retention of Urine, excessive accumulation of urine in the bladder from inability to pass it.

Saturated Solution, a solution as strong as it can be made.

Sepsis, a local affection of the tissues or a general affection of the system caused, directly or indirectly, by the presence of certain species of germs; a kind of blood-poisoning.

Septic, pertaining to sepsis or its causes; affected with sepsis.

Sterilize, to make germ-free.

Suprapubic, pertaining to that part of the abdominal wall immediately above the pubes.

Suture, a thread of silk or other material for sewing together the lips of a wound.

Top Milk, the mixed cream and milk from the top of a bottle of milk on which the cream has risen. Ten-ounce top milk is the top ten ounces. Sixteen-ounce top milk, the top sixteen ounces, and so on.

Umbilicus, the navel.

Urethra, the canal through which the urine is discharged from the bladder, about one and three-fourths inch in length.

Uterus, the womb.

Vagina, the canal leading from the external sexual organs to the uterus.

Vulva, essentially the external sexual organs of the female.

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